CLAIMS

1) A method for forming a module intended for real-time simulation of the flow mode, at any point of a pipe, of a multiphase fluid stream comprising at least a liquid phase and at least a gas phase, so that it is best suited to fixed operating conditions concerning a certain number of determined structure parameters relative to the pipe, and a set of determined physical quantities, with fixed variation ranges for said parameters and said physical quantities, by means of a modelling system based on non-linear neural networks having each inputs for structure parameters and physical quantities, outputs where quantities necessary for estimation of the flow mode are available, and at least one intermediate layer, the neural networks being determined iteratively so as to adjust to the values of a learning base with predetermined tables connecting various values obtained for the output data to the corresponding values of the input data, characterized in that a learning base suited to the imposed operating conditions is formed and optimized neural networks best adjusting to the imposed operating conditions are generated.

2) A method as claimed in claim 1, characterized in that the set of physical quantities consists of hydrodynamic quantities.

3) A method as claimed in claim 1, characterized in that the set of physical quantities consists of thermodynamic quantities.

4) A method as claimed in any one of the previous claims, characterized in that, said module being integrated in a general, both hydrodynamic and thermodynamic multiphase flow simulation model, said model is used to form the learning base so as to

select the set of physical quantities that is best suited to the model, as well as the variation ranges fixed for said parameters and said physical quantities, and the optimized neural networks best suited to the learning base formed are generated.